

CLAIMS

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows.

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1. A capacitive responsive electronic switching circuit comprising:
an oscillator providing a periodic output signal having a frequency of 50 kHz or greater;
an input touch terminal defining an area for an operator to provide an input by touch; and
a detector circuit coupled to said oscillator for receiving said periodic output signal from
said oscillator, and coupled to said input touch terminal, said detector circuit being responsive
to signals from said oscillator and the presence of an operator's body capacitance coupled to said
touch terminal when touched by an operator to provide a control output signal.
2. The switching circuit as defined in claim 1, wherein said oscillator provides a
periodic output signal having a frequency of 800 kHz or greater.
3. The switching circuit as defined in claim 1 and further including a DC power
supply for supplying power to said oscillator and a ~~reference to an external~~ ground.
4. The switching circuit as defined in claim 1, wherein said periodic output signal
provided by said oscillator is a square wave output signal, said oscillator includes a square wave
generator for generating a square wave, and a plurality of active elements coupled to an output

of said square wave generator to buffer and improve the shape of the square wave output therefrom.

5. The switching circuit as defined in claim 1 and further including a floating ground generator coupled to said oscillator for receiving said square wave output signal, said floating ground generator generating a floating ground reference for said detector circuit that is set at a fixed voltage below and tracks the square wave output signal.

6. The switching circuit as defined in claim 5, wherein said detector circuit is powered by said square wave output signal provided by said oscillator and said floating ground reference provided by said floating ground generator to increase the sensitivity of said detector circuit to touching of said touch terminal by an operator's body.

11. 7. The switching circuit as defined in claim 6, wherein said detector circuit includes a microcontroller and a charge pump circuit coupled between said input touch terminal and said microcontroller.

5. 8. The switching circuit as defined in claim 1, wherein said detector circuit includes a microcontroller and a charge pump circuit coupled between said input touch terminal and said microcontroller.

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9. The switching circuit as defined in claim 1, wherein said detector circuit includes a microcontroller and a touch circuit coupled between said input touch terminal and said microcontroller.

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10. The switching circuit as defined in claim 9 and further including a plurality of said input touch terminals and a plurality of said touch circuits respectively associated with said input touch terminals.

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11. The switching circuit as defined in claim 10, wherein said microcontroller selectively applies said periodic output signals received from said oscillator to each of said touch circuits to separately activate each touch circuit.

12. A touch controlled switching circuit comprising:

an oscillator providing a square wave output signal having a frequency of 50 kHz or greater;

a touch terminal defining an input terminal for coupling to an operator's body capacitance; and

a charge pump circuit coupled to said oscillator for receiving said square wave output signal, and coupled to said touch terminal, said charge pump circuit having an output terminal that supplies an output signal having a voltage that varies when said touch terminal is touched

by an operator's body,

wherein said charge pump circuit includes at least one high speed diode coupled between said oscillator and said touch terminal, for enhancing a sensitivity at which said charge pump responds to sensed body capacitance at said touch terminal for higher frequencies.

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13. The touch control circuit as defined in claim 12 and further including a DC power supply for supplying power to said oscillator and a reference to an external ground.

proximity and touch controlled
a 14. The ~~touch control~~ circuit as defined in claim 12, wherein said oscillator includes a square wave generator for generating a square wave, and a plurality of active elements coupled to an output of said square wave generator to buffer and improve the shape of the square wave output therefrom.

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15. The touch control circuit as defined in claim 12 and further including a floating ground generator coupled to said oscillator for receiving said square wave output signal, said floating ground generator generating a floating ground reference for said charge pump circuit that is set at a fixed voltage below and tracks said square wave output signal.

16. The touch control circuit as defined in claim 15, wherein said charge pump circuit is powered by said square wave output signal provided by said oscillator and said floating

sub. 66 ground reference provided by said floating ground generator to increase the sensitivity of said charge pump circuit to touching of said touch terminal by an operator's body.

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The touch control circuit as defined in claim 12, wherein said oscillator provides a periodic output signal having a frequency of 800 kHz or greater.

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18. A capacitive responsive electronic switching circuit comprising:

an oscillator providing a periodic output signal having a predefined frequency;

a plurality of input touch terminals defining adjacent areas on a dielectric substrate for

an operator to provide inputs by touch, and

a detector circuit coupled to said oscillator for receiving said periodic output signal from said oscillator, and coupled to said input touch terminals, said detector circuit being responsive to signals from said oscillator and the presence of an operator's body capacitance coupled said touch terminals when touched by an operator to provide a control output signal,

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wherein said predefined frequency of said oscillator is selected to decrease the impedance of said dielectric substrate relative to the impedance of any contaminant that may create an electrical on said dielectric substrate path between said adjacent areas.

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19. The switching circuit as defined in claim 18, wherein said oscillator provides a periodic output signal having a frequency of 800 kHz or greater.

20. A capacitive responsive electronic switching circuit comprising:
an oscillator providing a periodic output signal having a predefined frequency;
a dome-shaped touch terminal defining an area for an operator to provide an input by
touch, wherein the dome shape of the touch terminal is constructed to ergonomically fit the palm
of a human hand; and

a detector circuit coupled to said oscillator for receiving said periodic output signal from
said oscillator, and coupled to said input touch terminals, said detector circuit being responsive
to signals from said oscillator and the presence of an operator's body capacitance coupled said
touch terminals when touched by an operator to provide a control output signal.